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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,310	03/01/2004	Deok-heung Kim	03918-P0041A	9330

24126 7590 02/23/2006

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EXAMINER	
NORRIS, JEREMY C	
ART UNIT	PAPER NUMBER
2841	

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/790,310	KIM ET AL.	
	Examiner	Art Unit	
	Jeremy C. Norris	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *3-1-04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,408,052 (Inaba).

Inaba discloses, referring primarily to figure 1, a flexible printed circuit board comprising; a base film (1) formed of a flexible insulation material and having an end portion and a main portion, the base film including a first connection hole (5) formed adjacent to the end portion and a second connection hole (5) formed at the main portion; a first conductive layer (4) formed on an outer surface of the base film including an area covering the first and second connection holes of the base film; a second conductive layer (2) formed on an inner surface of the base film including an area covering the first connection hole of the base film, the second conductive layer being electrically connected to the first conductive layer through the first connection hole; and a third conductive layer (2) formed on an inner surface of the base film including an area covering the second connection hole of the base film, the third conductive layer being

electrically connected to the first conductive layer through the second connection hole, the third conductive layer being separated from the second conductive layer [claim 1], further comprising a first cover layer (8) formed of a flexible insulation material and covering the first conductive layer [claim 2], further comprising a second cover layer (8) formed of a flexible insulation material and covering the third conductive layer [claim 3], wherein the first and third conductive layers including a circuit pattern (col. 2, lines 15-30) [claim 4], wherein the base film is formed of a resin (col. 2, lines 15-30) [claim 7], wherein the first, second and third conductive layer are formed of a material comprising copper (col. 2, lines 15-50) [claim 8], wherein the first and second connection holes are filled with a conductive material (5) [claim 9], wherein the end portion of the circuit board is configured to connect to a terminal of an electronic device [claim 10].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inaba in view of US 6,041,495 (Yoon).

Inaba discloses the claimed invention as described above except Inaba does not specifically state a fourth conductive layer substantially covering the second conductive layer [claim 5]. However, it is well known in the art to cover a copper external terminal with another conductive layer as evidenced by Yoon (col. 6, lines 45-55). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to cover the second conductive layer in the invention of Inaba with a fourth conductive layer as is known in the art and evidenced by Yoon. The motivation for doing so would have been to protect the terminals from oxidation. Moreover, the combination of Inaba in view of Yoon teaches that the fourth conductive layer is formed of nickel, gold, or aluminum (Yoon, col. 6, lines 45-55) [claim 6].

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inaba in view of US 5,471,438 (Kobayashi).

Inaba discloses the claimed invention as described above except Inaba does not specifically state that the electronic device is a liquid crystal display device [claim 11]. Instead, Inaba generically teaches that the flexible board is to be connected to "a device" (col. 1, lines 20-25). However, it is well known in the art to connect flexible boards to liquid display devices as evidenced by Kobayashi (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to connect the flexible board of the invention of Inaba with a liquid crystal display device as is known in the art and evidenced by Kobayashi. The motivation for doing so would have been to allow for signal transmission between the board and the liquid crystal display device.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Inaba.

Inaba discloses the claimed invention as described above except Inaba does not specifically state that the first conductive layer is located substantially along a neutral line of a curve where an internal stress is about zero when the circuit board is subject to bending [claim 12]. However, it is well known in the art to locate layers in such a manner. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to locate the first layer in the invention of Inaba substantially along a neutral line of a curve where an internal stress is about zero when the circuit board is subject to bending. The motivation for doing so would have been to reduce the

stress/strain on the layer and just reduce the chance of cracking. Moreover, it has been held that more than a mere change of form is necessary for patentability. Span-Deck, Inc v. Fab-con, Inc. (CA 8, 1982) 215 USPQ 835.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 5,742,480, granted to Sawada et al, discloses a flexible printed wiring board.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCSN

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